PB84-168780

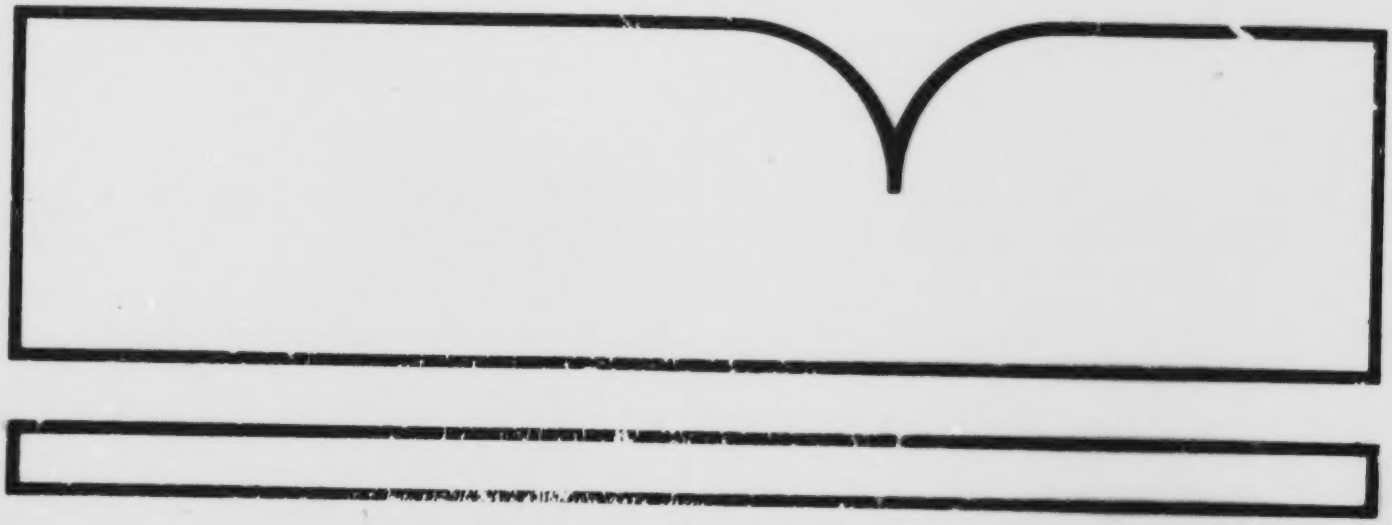
Manual and Training Course for Prevention of Spills of Hazardous Substances at Fixed Facilities

Rockwell International, Newbury Park, CA

Prepared for

Municipal Environmental Research Lab.
Cincinnati, OH

1984



U.S. Department of Commerce
National Technical Information Service
NTIS

PB84-168780

EPA-600/D-84-073
1984

MANUAL AND TRAINING COURSE FOR PREVENTION OF SPILLS OF HAZARDOUS SUBSTANCES AT FIXED FACILITIES

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REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

TECHNICAL REPORT DATA

(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-600/D-84-073	2.
3. RECIPIENT'S ACCESSION NO. PB84 168780	
4. TITLE AND SUBTITLE MANUAL AND TRAINING COURSE FOR PREVENTION OF SPILLS OF HAZARDOUS SUBSTANCES AT FIXED FACILITIES	5. REPORT DATE 1984
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Walter Unterberg. Kathlen S. Roos, Patricia A. Scofield, K. Jack Kooyoomjian, & Leo T. McCarthy, Jr.	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Rockwell International 2421 West Hillcrest Dr. Newbury Park, CA 91320	10. PROGRAM ELEMENT NO. CBRD1A
	11. CONTRACT/GRANT NO. 68-03-3014
12. SPONSORING AGENCY NAME AND ADDRESS Municipal Environmental Research Laboratory-Cin., OH Office of Research and Development U.S. Environmental Protection Agency Cincinnati, Ohio 45268	13. TYPE OF REPORT AND PERIOD COVERED Paper
	14. SPONSORING AGENCY CODE EPA/600/14

15. SUPPLEMENTARY NOTES
Project Officer: Leo T. McCarthy, Jr. (201) 321-6629

16. ABSTRACT

The purpose of this manual and training course is to prevent spills of hazardous substances in fixed facilities which are those facilities that produce the substances from raw or starter materials, store the substances, or transfer the substances to and from transportation terminals. The emphasis is on smaller-sized chemicals manufacturing facilities. This paper describes the contents of the manual and training course which are coordinated in that the manual is the reference text for the video tape training course. The manual consists of five sections: 1. Introduction and Instructions; 2. Manual of Practice; 3. Hazardous Substances and Fixed Facilities; 4. Facility Spill Prevention Practices; and 5. Preventive Engineering Concepts. Section 1 contains the purpose of the manual, the sources used in preparing it (various government and industry publications), an overview of the manual, and how to use it. Section 2 is the manual proper, which deals with the preparation of a Facility Spill Prevention Master Plan. To this end, the facility is evaluated for areas and equipment items which interact with hazardous substances-be they raw materials, products, byproducts, or wastes. A Spill Prevention Committee oversees the preparation of the plan. Section 3 contains a listing of all hazardous substances under consideration, with their physical behavior on release to air, water and ground, and their specific hazards. Further, it includes tables of the fixed facility equipment components, mainly related to chemical processing, from which a checklist of equipment items interacting with hazardous substances is derived for use in preparing the Spill Prevention Plan. Section 4 lists the various spill prevention practices, including organization, risk identification, material compatiblity, preventive maintenance, good housekeeping, security and training. Secton 5 details the preventive engineering practices such as monitoring and secondary containment of storage vessels, proper labeling, leak detectors, alarm systems, fail-safe valves, drainage, waste treatment, etc.

The video tape course is designed for a 4-hour training session led by an instructor. It is built around two 30-minute videotapes (the first illustrating manual Sections 1 and 2, the second Sections 3 through 5), each followed by a discussion period. The session concludes with an exercise period in which participants divide into small groups and work on spill prevention plans for typical facilities for which data have been provided. The handouts for the course are: 1. Session agenda with an outline of tape topics; 2. An exercise package for the concluding exercise by participants, and 3. The Manual as a reference text. The course is designed to be given initially to representatives from fixed facilities who will in turn act as instructors in presenting the course to personnel at their facilities. Portions of the training tapes will be included in the presentation of this paper.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group

18. DISTRIBUTION STATEMENT RELEASE TO PUBLIC	19. SECURITY CLASS (This Report) UNCLASSIFIED	21. NO. OF PAGES 25
	20. SECURITY CLASS (This page) UNCLASSIFIED	22. PRICE

EPA Form 2220-1 (9-73)

NOTICE

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REVISED DECEMBER 1983

Paper No. 113 for 1984 Hazardous Materials Spills Conference
Nashville, TN, April 9-12, 1984

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ABSTRACT

The purpose of this manual and training course is to prevent spills of hazardous substances in fixed facilities which are those facilities that produce the substances from raw or starter materials, store the substances, or transfer the substances to and from transportation terminals. The emphasis is on smaller-sized chemicals manufacturing facilities. This paper describes the contents of the manual and traning course which are coordinated in that the manual is the reference text for the video tape training course.

INTRODUCTION

This paper describes a manual and coordinated training course on prevention of spills of hazardous substances from fixed facilities which (1) produce the substances from raw or starter materials as products, by-products or waste products, (2) store the substances, or (3) transfer the substances to and from transportation terminals. The substances in question number over 600, excluding oil, and are those designated in Section 102 of the Comprehensive Environmental Response Compensation and Liability Act of 1980 (Public Law 96-510 or CERCLA).

The earlier Clean Water Act (Public Law 92-500, or CWA), in Section 311, required that the President issue regulations "establishing procedures, methods and equipment.... to prevent discharges of oil and hazardous substances from vessels and from onshore and offshore facilties...". Under a 1973 Executive Order, EPA has the responsibility for preventing non-transportation-related spills.

In the case of oil, the EPA issued in 1973 the Oil Pollution Prevention Regulations (40 CFR Part 112) which require fixed facilities to have on file a Spill Prevention Control and Countermeasure Plan (SPCC Plan). This regulation has been largely accepted by industry and has proved effective in preventing oil spills.

In the case of hazardous substances no similar federal regulation exists at this time. In its own interest a large segment of the industry producing, storing and handling hazardous substances has instituted internal spill prevention plans. Many of the affected smaller-sized facilities for various

reasons may not have generated spill prevention plans. The manual and training course are designed to assist them in preparing such plans.

This paper discusses the various sections of the methodology, i.e., (1) the formation of a plant spill prevention organization with the steps for preparing the Facility Spill Prevention Master Plan; (2) the listing of all the substances with their physical properties on release and the associated hazards; (3) the listing of equipment components found in fixed facilities, mainly related to chemical processing; (4) general spill prevention practices of a procedural nature; and (5) preventive engineering practices oriented toward the equipment items which are the potential sources of spills. Lastly, the 4-hour training course which incorporates two 30-minute videotapes is described. The course is led by an instructor and uses the manual as a text. The participants are from fixed facilities and will, in turn, act as instructors and present the course to personnel at their facilities. The style and working of the manual and training course are designed for a wide audience, from "hands-on" to supervisory and managerial levels. The authors may be contacted for availability of the complete manual and training course.

MANUAL OF PRACTICE

This section contains the procedure to be followed in developing a Facility Spill Prevention Master Plan. The steps in the procedure will be expanded on in subsequent sections, but are given below in itemized form:

1. Form a facility spill prevention organization supervised by a part-time or full-time manager and backed by the plant management.

2. Prepare a prevention policy statement approved by management.

3. Define facility boundaries and prepare flowsheets indicating generation and storage of all substances within these boundaries, as well as inflow and outflow of substances across the boundaries. Substances to include raw materials, products, byproducts, wastes, fuels, lubes, paints, pesticides, disinfectants, etc. Normal and overload conditions should be noted.

4. List which of the substances are hazardous by reference to the section on "Hazardous Substances and Their Characteristics". Note the media into which the substances would be released, their physical behavior on release, and the hazards caused by the release.

5. List all facility areas and equipment items which interact with hazardous substances. Include storage vessels of all kinds (gas, liquid, solid) process vessels and columns, flow systems including valves and controls, receiving and shipping terminals of all kinds (road, rail, water, air), and waste treatment and disposal areas. Use checklist in section on "Fixed Facilities" to cover all areas and equipment.

6. For each area and equipment item of interest list:

   a) possible failure modes

b) amount of hazardous substance involved

c) hazards caused by possible release of substance (from 4. above)

d) specific effects expected on remainder of facility and surroundings, considering equipment and personnel at various times and under varying weather conditions.

7. For each area and equipment item look over the section on "Facility Spill Prevention Practices" (SPP's) and extract the SPP's applying to the facility.

8. For each area and equipment item look over the section on "Preventive Engineering Practices" (PEP's) and extract the PEP's applying to the facility.

9. Write a Facility Spill Prevention Master Plan under direction of the manager by combining information from items 3. thru 8. above. The plan should consider drainage to receiving waters and possible regrading of facility terrain. The plan should include a timetable for its implementation i.e., carrying out the SPP's and PEP's.

10. The plan should be approved by the plant management and implemented under direction of the spill prevention organization, which should also be responsible for its periodic review and revision.

HAZARDOUS SUBSTANCES AND THEIR CHARACTERISTICS

In order to find out whether a substance present in the facility is hazardous as defined by CERCLA, the full manual includes a number of tables which cover all the 600-plus substances and give their characteristics. Once all the substances within the plant have been identified, they should be checked against these tables to find out which ones are hazardous and only those need to be further considered.

Hazardous substances may be gases, liquids or solids and they may be released to air, water or ground. The following tables are part of the manual:

1. Liquids and solids spilled on water
2. Liquids spilled on ground
3. Solids (particulates) released to air or ground
4. Gases released to air

Figure 1 is an excerpt from Table 1, which has 5 columns: (1) alphabetical continuous listing of substances, primarily chemical compounds; (2) chemical class, sometimes more than one; (3) Chemical Abstract Service (CAS) number, a standard in case substances are known by more than one name; (4) Hazards in addition to toxicity; and (5) behavior in water, i.e., sink/float and soluble/insoluble.

The hazards are defined in 49 CFR 173 (DOT Transportation Regulations), the Clean Water Act and by the U.S. Department of Health and Human Services. An asterisk (*) designates definitions developed during this work. An alphabetical series of abbreviated definitions of the hazards shown in the fourth column follows:

Carcinogens - substances identified as potentially cancer-producing in humans.

Combustibles - liquid or solids having a flash point at or above 100°F and below 300°F. The upper limit was changed from the DOT value of 200°F to 300°F to realistically include more combustibles.

Corrosive - causing visible destruction or irreversible alterations in human skin tissue at the site of contact.

Explosive - Any chemical compound, mixture, or device providing substantially instantaneous release of gas and heat.

Flammable - substances as defined in 49 CFR 173.300 (gas), 49 CFR 173.115 (liquid) and 49 CFR 173.150 (solid).

Oxidizer - A substance that yields oxygen readily to stimulate the combustion of organic matter.

Poisons - substances so classed or labelled in 49CFR172.101.

* Polymerizable - a substance undergoing a rapid exothermic polymerization reaction initiated by exposure to either heat, light, acids, caustics, or other initiating source.

Radioactive Material - spontaneously emits ionizing radiation.

* Reactive - a substance that readily undergoes violent change without detonation in the presence of water or moist air, or even dry air ~~of~~ or oxygen

Toxic Pollutants - upon exposure, ingestion, inhalation or assimilation into any organism, cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions or physical deformations.

Understanding the various hazards permits effective preventive countermeasures to be selected. The material in this section is used for the input to Item 4 of the Manual of Practice.

FIXED FACILITIES

A checklist of all facility areas and components is useful for developing the complete listing of all plant interactions with hazardous substances in Item 5 of the Manual of Practice. Reference to the Chemical Engineer's Handbook led to the twenty major categories shown in Table 1, which cover processing, transportation, storage, drainage and waste treatment, and disposal. In the complete manual Table 1 will be expanded to include subdivisions of the categories shown here.

FACILITY SPILL PREVENTION PRACTICES

Unde this heading fall general procedures which are independent of the exact nature of the facility - its processes and products. While most Spill Prevention Practices (SPP's) are based on common sense and experience and provide few new revelations, it is considered useful to have this compilation of procedures when preparing a Spill Prevention Master Plan. The sources from which some have been drawn are government and industry reports and publications. Some of the SPP's listed here overlap into related areas such as response to a spill, maintenance, training and others. If the facility already has plans and procedures in these areas, they can be adapted and slanted to the present purpose. A short discussion will be given for each SPP listed.

Spill Prevention Organization

The Facility Spill Prevention Committee (SPC) is a group within the plant responsible for developing the Spill Prevention Master Plan (SPMP) for hazardous materials and assisting management in implementation, maintenance and improvement of the Plan. The size of the SPC should depend on the plant size and it should be headed by a part-time or full-time Manager. Thus for a very small facility handling few chemicals part-time assistance from a larger plant may suffice. The initial task of the SPC is to prepare a policy statement for management approval, stating overall goals and outlining the specific ongoing activities of the SPC which could include the following:

- Identify all toxic and hazardous substances at the facility
- Identify all potential spill sources
- Establish incident reporting procedures
- Assess risks at different plant locations
- Develop inspection and record procedures
- Review historical incidents and remedies
- Coordinate incident response, cleanup, and notification procedures
- Establish training program for plant and contractor personnel
- Assist in interdepartmental spill prevention coordination
- Review new construction and/or changes in processes and procedures

Risk Identification and Assessment

All facility areas should be examined for the potential risks of a hazardous substance release. The areas are to be drawn or mapped and a flow diagram showing major process operations developed to indicate direction and quantity (volume) of materials flowing from one area to another. Storage areas and transportation terminals should also be located on the diagram and the direction of flow of potential spills should be estimated. A hazardous substance inventory should be taken.

In a risk assessment the quantity of material, its degree of hazard (also whether single or multiple) and its distance from the plant boundary and/or sensitive environment (e.g., a watercourse) are combined in a risk "score". Thus high risk areas can be readily located and given special attention. Another factor is the interrelation of various processes and activities which are carried out close to each other in space or time. For instance, using solvents to clean equipment near electrical motors will be a high-risk operation if the motors are running and generating heat and sparks, but low-risk if the motors are shut down during cleaning.

Planned future changes in materials inventory and processes should be examined beforehand as to possible risks, and design changes to eliminate risks should be adopted before activating new systems.

Materials Compatibility

The specific requirement for materials compatibility should provide procedures to address the design and operation of equipement used in handling hazardous materials. Material compatibility encompasses three

aspects: compatibility of the chemicals handled with container construction materials, compatibility of the mixture of chemicals in a container, and compatibility of the container with its environment.

The engineering practices in the plant should be evaluated and summarized with regard to corrosion and other aspects of material compatibility. Practices such as mixing of chemicals and possible contact with various materials that may result in fire, explosion, or unusual corrosion or reactivity, cleaning of storage vessels and tanks, equipment and materials testing are to be evaluated and their potential for a release estimated. Recommendations for improved procedures should be made.

Reporting and Recordkeeping

An internal incident report system should be used to keep records of incidents such as controlled spills, leaks, runoff, and the like for the purpose of minimizing reocurrence, expediting mitigation or cleanup activities, and complying with legal requirements. The primary reporting procedures should include notification of a discharge to appropriate plant personnel to initiate immediate action, and formal written reports for review and evaluation by management of the spill incident. Governmental and environmental agencies should be notified in the event that the spill or other reportable discharge reaches beyond facility boundaries.

Proper distribution and filing of these reports is important to the activities of the SPC, as well as the safe operation of the facility and the good health of its employees. It should be kept in mind that all the

hazardous substances are toxic to human and other organisms if improperly handled.

Good Housekeeping

Good housekeeping is the maintenance of a clean, orderly work environment, that contributes to overall facility pollution control efforts. The principal elements in good housekeeping include proper storage of chemicals, prompt removal of spillage, floor maintenance, and unobstructed pathways and walkways. Methods for maintaining good housekeeping goals and employee interest are also key aspects.

For example, solid material storage piles and drum lots should be covered to prevent leaching by rainwater; metal and fiber containers should be loaded, stored, and unloaded in a manner that will minimize the possibility of container damage. Chemicals of compatible nature must be stored in a neat, orderly, and easily accessed fashion. Chemicals stored in drums or bags should be staged according to chemical type. Storage vessels, tanks, sample containers, bags, pipes, barrels, etc. should be checked for integrity as well as compatibility with materials stored. Chemical staging must be accomplished in distinct separate areas and the areas and types of chemials stored must be labeled. An inventory and plot diagram of stored chemicals is needed to pinpoint any weak points where an incident could occur. In case of spills collection drains, pumps, and/or wet vacuums may be required to collect washdown waters to prevent discharge into waterways. Required fire extinguishers should be placed in all storage areas.

Preventive Maintenance

Preventive maintenance (PM) involves inspection and testing of facility equipment and systems to uncover conditions that could cause breakdowns or failures. These are prevented by adjustment, repair, or replacement of items. A good PM program should include the following elements: (1) identification of eqiupment and systems that require PM, (2) periodic testing and inspection, (3) apropriate adjustment, repair, or replacement of items, and (4) complete PM maintenance records.

Table 1 should be checked item by item to ensure that proper controls, alarms, and other precautionary features are in place. This includes detection equipment to pinpoint any leaks before they become massive spills or releases, such as atmospheric hazard indicators (combustible gas, oxygen, radiation, etc.) and plant effluent monitors.

Life span of equipment (such as internal steam coils) should be estimated based on previous data and experience, and replacements should be made prior to the life span limit. To reduce failure from corrosive action, prolong life and reduce replacement costs, the temperature and environment should be considered in material selection. Recordkeeping is of extreme importance in keeping track of the age and lifespan of components so that adjustment, repair or replacement can be carried out at the proper time.

Inspection Systems

The purpose of an inspection system is to detect actual or potential incidents using visual observation, nondestructive testing, acoustic monitoring and other suitable methods. Inspection procedures should be written and the frequency of inspection determined. Records identifying

the completion date and results of each inspection should be maintained for a period of at least 3 years and signed by the appropriate supervisor. The establishment of the inspection recording system should ensure that adequate resonse and corrective action has been taken. This recordkeeping system can be incorporated into the facility spill reporting system.

One should perform three major types of inspection--preservice, inservice (periodic), and equipment termination. Preservice inspection requires that new equipment received by the facility undergo inspection to ensure that the equipment is made according to design and construction specifications, and is not faulty. Inservice or periodic inspections are conducted during the operational phase of the equipment. This is the type of inspection throughout the expected life of the equipment which will indicate possible malfunctions. The termination inspection is an inspection of eqiupment prior to removal from service.

Security

A security system is needed to prevent accidental or intentional entry to a facility which may result in vandalism, theft, sabotage, or other improper or illegal use of plant facilities that could possibly cause a release. The existing security system should be evaluated to ensure that those areas or equipment identified as having the potential for incidents are adequately monitored. Based on this evaluation, recommendations for changes should be directed to facility management. Security measures include use of security personnel for leak surveillance.

Employee Training

Spill prevention training can be carried out as part of a general training program or it can be done by itself, e.g., using the training course described later in this paper. New employees should always be briefed on this important subject. Employee training meetings should be conducted at least annually to assure adequate understanding of the objectives of a spill prevention program. The meetings should highlight previous spill events or failures, malfunctioning equipment components, and recently developed precautionary measures.

Adequate training in a particular job and process operation is essential for understanding potential discharge problems. Trianing sessions should also include notification procedures, spill prevention and control procedure, as well as emergency response and actions.

Environmental or spill drills serve to improve employee reactions to releases. Well-planned drills should be conducted at least semi-annually to pinpoint important potential spill problems in the facility.

PREVENTIVE ENGINNERING PRACTICES

Preventive Engineering Practices (PEPs) may be thought of as SPPs that are oriented toward equipment rather than procedures and are specific to groups of toxic and hazardous substances and to the potential sources of the spill: storage area; loading/unloading areas; in-plant transfer, process and materials handling areas; drainage from plant site and secondary containment structures; and waste storage, treatment, and disposal facilties.

PEPs are divided into two groups--pre-release, and

post-release--both are designed to confine releases within the facility boundaries. The difference between the two groups is that pre-release PEP's are of a general precautionary nature, whereas post-release PEP's are activated into functioning as spill control devices by the release itself. Typical pre-release PEP's include: monitoring and alarm systems; nondestructive testing; labeling all storage, process and flow equipment; and proper storage procedures. Typical post-release PEP's include: secondary containment of liquids and solids by dikes and berms; flow diversion; vapor control; and dust control.

In the complete manual the PEP's are grouped by the major equipment and plant area categories mentioned in the first paragraph of this section. The following is an outline with typical PEP's, both pre-release and post-release:

Bulk Storage Areas - subject to leakage, runoff, leaching, windblowing - depending on physical state of material stored:

- Tank material or lining compatibility with stored material
- Stockpiling patching and plugging devices
- High and low level alarms
- Safe placement of storage vessels - remote from traffic, residential areas, surface water bodies
- Fire protection sysems - extinguishing agents, insulation against explosions from flame impingement
- Corrosion monitoring and inspection
- Secondary containment of adequate holding capacity (largest

single container plus allowance for precipitation)

- Segregation of incompatible materials
- Appropriate material for secondary containment - impervious to, noncorrodable by, and compatible with liquids
- Catch basins or drums under tank values for storage of overflow and/or conducting overflow to sump/treatment facility

Loading and Unloading Areas

- Same PEP's as above for bulk storage areas
- Proper labeling/color coding of pipes and fittings
- Separate docks/gates for incompatible feedstocks: different size or color connectors to avoid cross-connection
- Noninterfering vehicle positioning
- Pneumatic or vacuum conveying where possible
- Proper hookups - noninterfering, flexible
- Liquid and vapor disposal devices - using foams, fans, etc.

In-Plant Transfer, Process and Material Storage Area- primarily proper operation of equipment.

- Structural design of pressure vessels (fired and unfired) to withstand accidental overpressure without wall failure
- Use of compatible materials for process equipment
- Proper labeling/color coding of vessels, piping, and flow

components

- o Alarm systems - active and passive
- o Splash shields guarding against pressure release venting sprays
- o Positive closure valves in critical places
- o Containment structures/holding ponds sufficient to hold volume of largest storage container or a day's volume of plant process liquid, whichever is larger.

Drainage Control - diversion or collection of plant site runoff and controlled release of accumulated precipitation from secondary containment structures:

- o Examine plant drainage topography and, if needed, regrade for drainage to waste treatment facilities or holding pond
- o Alternatively, entire plant boundary could be diked
- o Types of collection and diversion structures: curbs, culverts, gutters, sewers, drainage ditches
- o Open drums to catch minor spills from drain/drawoff valves on vessels
- o Control of drainage from secondary containment drain pipes with lockable valves or pumping into vacuum truck for later discharge/disposal

Waste Storage, Treatment, and/or Disposal Facilities

- Location - downgradient of plant
- Capacity - largest tank volume in facility or one day's volume of process liquid, whichever is larger, with precipitation allowance
- Control of drainage/disposal from waste facilities

VIDEOTAPE TRAINING COURSE

This training course is intended for all levels of personnel responsible for spill prevention at chemical manufacturing facilities. The course is a 4-hour training session led by an instructor. It is built around two 30-minute videotapes, each followed by a discussion period. The session concludes with an exercise period in which participants divide into small groups and work on spill prevention plans for typical facilities for which data have been provided.

The outline of the videotape training course is shown on Figure 2. There are two 15-minute breaks, one after each tape. The first tape is devoted to spill prevention program development and spill prevention practices, the second to preventive engineering practices. One hour is allowed for the in-class exercise.

The handouts for this course are: 1. Session agenda with outline of tape topics; 2. An exercise package for the concluding exercise by participants, and 3. The Manual as a reference text. In additiion, there is an Instructor's Guide. The course is designed to be given initially to representatives from fixed facilities who will in turn act as instructors in presenting the course to personnel at their facilities.

DISCLAIMER

This paper has been reviewed by the Municipal Environmental Research Laboratory - Cincinnati, U.S. Environmental Protection Agency, and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the U.S. Environmental Protection Agency, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

ACKNOWLEDGMENTS

This work was undertaken as part of Contract No. 68-03-3014 with the U.S. Environmental Protection Agency. Thanks are due to Robert Melvold, who contributed to the Hazardous Substance Characteristics and Preventive Engineering practices; and Robert Park who produced the videotapes. Both are with Rockwell International.

FIGURE 1. TYPICAL LISTING OF HAZARDOUS SUBSTANCE CHARACTERISTICS
RELEASES OF WATER OF LIQUIDS AND SOLIDS
(Excerpt)

Hazardous Substance	Chemical Class/Guide No	CAS No.	Hazard(s), in Addition to Toxicity	Behavior in Water
N-Nitrosodimethylamine	Nitroso compounds	62-75-9	Flammable w/toxic products Potential carcinogen	Soluble Sinker
N-Nitrosodiphenylamine	Nitroso compounds Amines, aryl	86-30-6	Potential carcinogen	Insoluble Sinke
N-Nitrosodi-n-propylamine	Nitroso compounds	621-64-7	Combustible w/toxic products Potential carcinogen	Insoluble Float
N-Nitrosamethylvinylamine	Nitroso compounds	4549-40-0	Flammable w/toxic products Potential carcinogen	Soluble Sinker
N-Nitrosopiperidine	Nitroso compounds	100-75-4	Potential carcinogen	Soluble Sinker
N-Nitrosopyrrolidine	Nitroso compounds	930-55-2	Combustible w/toxic products Potential carcinogen	Soluble Sinker
Nitrotoluene	Nitro compounds Aromatics	1321-12-6	Combustible w/toxic products	Insoluble Sinke
5-Nitro-o-toluidine (note 2)	Nitro compounds Aromatics	99-55-8		Insoluble Sinke
N,N'-Diethylhydrazine	Hydrazines and hydrazides	1615-80-1	Combustible w/toxic products Potential carcinogen	Soluble Floater
)ctamethylpyrophosphoramide	Amides, anilides, and imides Organophosphates	152-16-9		Soluble Sinker
Osmium tetroxide	Oxides Heavy metals	20816-12-0		Soluble Sinker
Paraformaldehyde	Aldehydes	30525-89-4	Combustible	Soluble Sinker
Paraldehyde	Aldehydes	123-63-7	Flammable	Soluble Floater
Parathion	Organophosphates	56-38-2	Poison	Insoluble Sinke

FIGURE 2. OUTLINE OF SPILL PREVENTION VIDEOTAPE TRAINING COURES

a.m.	
8:00	Introduction to the Hazardous Substances Spill Prevention Videotape Training Course.
8:15	Introduction to Tape I
8:30	Tape I - Spill Prevention Program Development Spill Prevention Practices
9:00	Discussion - Tape I
9:15	Break
9:30	Introduction to Tape II
9:45	Tape II - Preventive Engineering Practices
10:15	Discussion - Tape II (at end exercise materials are handed out)
10:30	Break
10:45	In-class Exercise: Spill Prevention Program for Typical Facilities
11:45	Conclusions/Discussion
12:00	End of Session